

Trend Study 27R-11-98

Study site name: Cockscomb Outside .

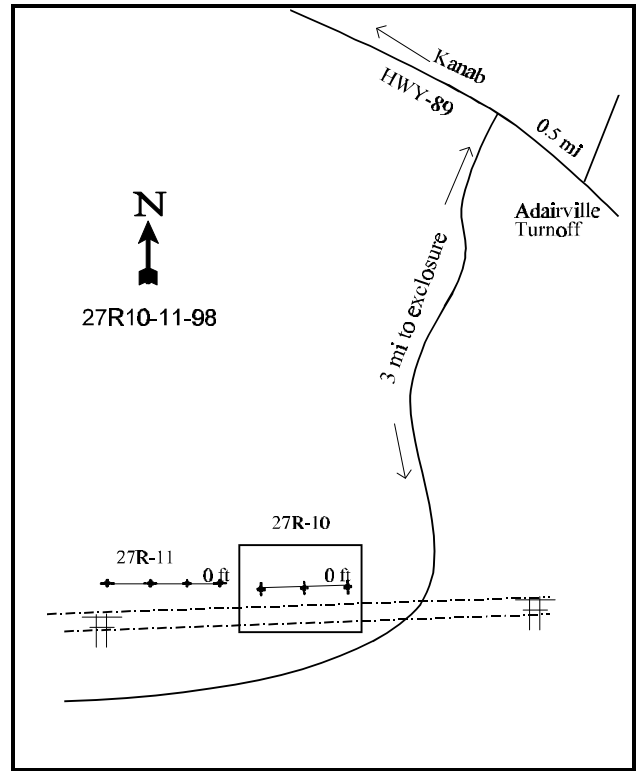
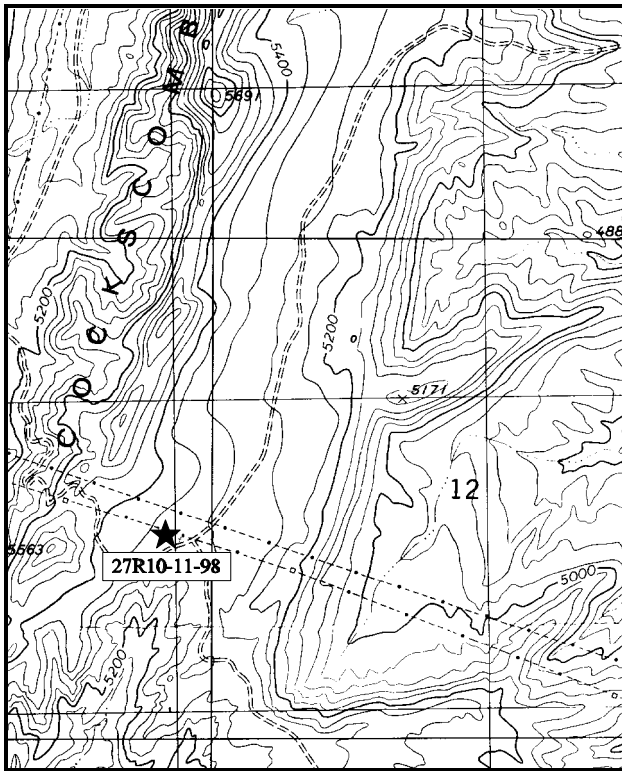
Range type: Desert Brush .

Compass bearing: frequency baseline 270°M degrees.

Footmark (first frame placement) 5 feet. Frequency belt placement; line 1 (11ft & 95 ft), line 2 (59ft), line 3 (34ft & 71 ft).

LOCATION DESCRIPTION

From HWY-89 and the Adairville turnoff (east of Kanab on south-89), go 0.5 miles west to a left turn. Turn left here and go 3 miles to an enclosure underneath the power lines. The baseline starts on the west side of the enclosure and can be located by counting up to the second metal post from the SW corner.



Map Name: West Clark Bench

Diagrammatic Sketch

Township 43S , Range 2W , Section 11

UTM 4104565.072 N, 412971.257 E

DISCUSSION

Trend Study No. 27R-11

This is a new trend study placed outside the livestock enclosure. The Cockscomb Enclosure is located about 30 miles east of Kanab and about 7 miles north of the Arizona-Utah border. This is a two-way enclosure (livestock and outside) in the most northern reaches of a hot desert shrub community at an elevation of approximately 5,360 feet. The aspect is to the east with a slight slope (6-7%). The site is located beneath a high voltage power line adjacent to the enclosure. A pellet group transect indicated 19 deer use days/acre and 10 cow days use/acre. A moderate density of rabbit pellet groups were also encountered.

Soil textural analysis indicates it to be a sandy loam soil with a neutral pH (6.9). Average effective rooting depth (see methods) is estimated to be 20 inches with an average soil temperature of 79°F at 14 inches. Both potassium and phosphorous measurements were low, 3.2 ppm and 2.7 ppm respectively, and may limit plant development. Values of 10 ppm for potassium and 70 ppm for phosphorous are considered the minimum for normal plant development. Rocks and pavement were encountered on the soil surface and combined they only provided almost 2% cover. Although percent bare ground cover is high (54%), there is little erosion apparent at this time due to the soil texture and the lack of significant slope.

Browse species currently provide 52% of the vegetative cover. The most abundant species include: shinnery oak, green ephedra, penstemon sp., yucca, and broom snakeweed. Shinnery oak has an estimated density of 4,280 stems/acre. Most of these plants are classified as mature (70%) and young (24%). Three seedlings were sampled in 1998. Percent decadency is estimated to 6% with 69% of these plants classified as dying. The dead to live ratio is 1:10, or 9% of the population is dead. Utilization is light and most plants exhibit good vigor. This population currently appears to be a stable. Green ephedra has an estimated density of 1,700 plants/acre. No seedling plants were encountered and 61% of the population were classified as mature. All of the decadent plants exhibited poor vigor and classified as chlorotic or dying. Twenty-two percent of the population exhibited poor vigor in 1998.

A shrubby penstemon spp. was encountered with an estimated density of 860 plants/acre. This is a mostly mature population with only one seedling sampled. No decadent plants were encountered and the dead to live ratio is 1:4 (20% were dead). Yucca has an estimated density of 660 plants/acre. This was also a mostly mature population with 85% of the plants classified as mature and 15% classified as young. Broom snakeweed had an estimated density of 500 plants/acre. Eighty-eight percent of the plants were classified as mature and the remaining 12% classified as young. Other browse species scattered throughout the area include: prickly pear cactus, sand sagebrush, buckwheat, and gray horsebrush.

Grass currently contributes 67% of the herbaceous understory cover. Sandhill muhly is the most abundant of the grass species, followed by Indian ricegrass and sand dropseed. Although annual species percent cover is low, they still account for 50% of the grass sum of nested frequency. Six weeks fescue provides 27% of the grass cover and 18% of the herbaceous understory cover. Cheatgrass is also present but in low abundance.

The forb component is dominated by perennial species that include: Cruciferae spp., fineleaf hymenopappus, and purple funnellily. Other perennial species scattered throughout the site include: bastard toadflax, Utah deervetch, and pale evening primrose. Only one annual forb was encountered (Gilia spp.) and is in low abundance.

1998 APPARENT TREND ASSESSMENT

Erosion is currently minimal with only slight soil movement apparent with some pedestaling noted around some the shrubs. Seedlings were encountered for a few of the browse species (broom snakeweed, buckwheat, penstemon sp., and shinnery oak). All of the browse species exhibited light utilization. With the exception of

green ephedra, all browse species showed good vigor. The herbaceous understory is relatively diverse, although most species were seldom sampled.

HERBACEOUS TRENDS --

Herd unit 27R, Study no: 11

T y p e	Species	Nested Frequency '98	Quadrat Frequency '98	Average Cover % '98
G	Aristida purpurea	1	1	.03
G	Bouteloua gracilis	22	9	.17
G	Bromus tectorum (a)	30	11	.13
G	Muhlenbergia pungens	144	47	4.03
G	Oryzopsis hymenoides	31	17	.22
G	Sporobolus cryptandrus	27	12	.36
G	Stipa comata	28	10	.13
G	Stipa lettermani	-	-	.00
G	Vulpia octoflora (a)	218	72	1.85
Total for Annual Grasses		248	83	1.98
Total for Perennial Grasses		253	96	4.96
Total for Grasses		501	179	6.95
F	Androstaphyllum breviflorum	55	23	.40
F	Arabis spp.	3	1	.00
F	Artemisia carruthii	4	2	.18
F	Comandra pallida	21	7	.13
F	Cruciferae	32	16	1.14
F	Cryptantha spp.	7	4	.07
F	Erigeron pumilus	2	1	.00
F	Gilia spp. (a)	10	3	.04
F	Hymenopappus filifolius	53	21	.95
F	Lotus utahensis	18	8	.17
F	Machaeranthera canescens	5	3	.05
F	Oenothera pallida	20	8	.16
F	Phlox longifolia	3	1	.00
F	Sphaeralcea coccinea	1	1	.00
F	Sphaeralcea parvifolia	3	2	.01
F	Townsendia spp.	9	5	.02
F	Unknown forb-perennial	4	2	.03
Total for Annual Forbs		10	3	0.03
Total for Perennial Forbs		240	105	3.37
Total for Forbs		250	108	3.41

BROWSE TRENDS --

Herd unit 27R, Study no: 11

Type	Species	Strip Frequency '98	Average Cover % '98
B	Artemisia filifolia	8	-
B	Ephedra viridis	24	1.70
B	Eriogonum spp.	14	.89
B	Gutierrezia sarothrae	18	.43
B	Juniperus osteosperma	-	.18
B	Opuntia polyacantha	5	.06
B	Penstemon spp.	22	.90
B	Quercus havardii	36	7.11
B	Tetradymia canescens	1	.15
B	Yucca spp.	9	-
Total for Browse		137	11.43

BASIC COVER --

Herd unit 27R, Study no: 11

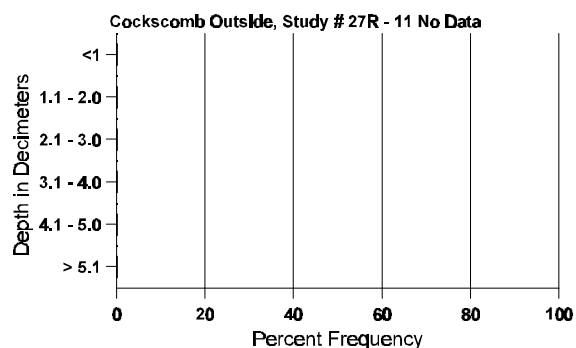
Cover Type	Nested Frequency '98	Average Cover % '98
Vegetation	370	31.28
Rock	42	.28
Pavement	130	1.41
Litter	466	33.50
Bare Ground	435	53.82

SOIL ANALYSIS DATA --

Herd Unit 27R, Study # 11, Study Name: Cockscomb Outside

Effective rooting depth (inches)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
19.7	79.3 (14.2)	6.9	72.2	18.0	9.84	.3	2.7	3.2	.3

Stoniness Index



PELLET GROUP FREQUENCY --

Herd unit 27R, Study no: 11

Type	Quadrat Frequency '98
Rabbit	18
Deer	12
Cattle	1

BROWSE CHARACTERISTICS --

Herd unit 27R, Study no: 11

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.	Total	
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia filifolia																		
M	98	9	-	-	-	-	-	-	-	-	9	-	-	-	180	26	27	9
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing '98		<u>Moderate Use</u> 00%				<u>Heavy Use</u> 00%				<u>Poor Vigor</u> 00%				<u>%Change</u>				
Total Plants/Acre (excluding Dead & Seedlings)														'98	180	Dec:	-	
Ephedra viridis																		
Y	98	28	-	-	-	-	-	2	-	-	29	-	1	-	600			30
M	98	37	7	-	7	-	-	1	-	-	37	-	15	-	1040	14	18	52
D	98	3	-	-	-	-	-	-	-	-	-	-	1	2	60			3
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	120			6
% Plants Showing '98		<u>Moderate Use</u> 08%				<u>Heavy Use</u> 00%				<u>Poor Vigor</u> 22%				<u>%Change</u>				
Total Plants/Acre (excluding Dead & Seedlings)														'98	1700	Dec:	4%	
Eriogonum spp.																		
S	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	98	15	-	-	1	-	-	-	-	-	16	-	-	-	320	14	25	16
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
% Plants Showing '98		<u>Moderate Use</u> 00%				<u>Heavy Use</u> 00%				<u>Poor Vigor</u> 00%				<u>%Change</u>				
Total Plants/Acre (excluding Dead & Seedlings)														'98	320	Dec:	-	
Gutierrezia sarothrae																		
S	98	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
Y	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	98	22	-	-	-	-	-	-	-	-	22	-	-	-	440	8	13	22
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing '98		<u>Moderate Use</u> 00%				<u>Heavy Use</u> 00%				<u>Poor Vigor</u> 00%				<u>%Change</u>				
Total Plants/Acre (excluding Dead & Seedlings)														'98	500	Dec:	-	

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Opuntia polyacantha																		
M	98	5	-	-	1	-	-	-	-	-	6	-	-	-	120	7	11	
D	98	3	-	-	-	-	-	-	-	-	3	-	-	-	60			
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	180	Dec:	33%	
Penstemon spp.																		
S	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
Y	98	7	-	-	-	-	-	-	-	-	7	-	-	-	140		7	
M	98	35	-	-	-	-	-	1	-	-	36	-	-	-	720	16	21	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	280		14	
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	860	Dec:	-	
Quercus havardii																		
S	98	6	-	-	-	-	-	-	-	-	6	-	-	-	120		6	
Y	98	52	-	-	-	-	-	-	-	-	52	-	-	-	1040		52	
M	98	121	10	-	18	-	-	-	-	-	146	-	3	-	2980	29	22	
D	98	10	2	-	1	-	-	-	-	-	3	-	1	9	260		13	
X	98	-	-	-	-	-	-	-	-	-	-	-	-	-	460		23	
% Plants Showing '98		<u>Moderate Use</u> 06%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 06%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	4280	Dec:	6%	
Tetradymia canescens																		
M	98	-	-	-	-	-	-	-	-	-	-	-	-	-	0	11	30	
D	98	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	20	Dec:	100%	
Yucca spp.																		
Y	98	5	-	-	-	-	-	-	-	-	5	-	-	-	100		5	
M	98	28	-	-	-	-	-	-	-	-	28	-	-	-	560	17	22	
% Plants Showing '98		<u>Moderate Use</u> 00%			<u>Heavy Use</u> 00%			<u>Poor Vigor</u> 00%			<u>%Change</u>							
Total Plants/Acre (excluding Dead & Seedlings)														'98	660	Dec:	-	